

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) An internal combustion engine with a plurality of cylinders, the engine including an intake manifold and an exhaust manifold, the engine further comprising:

a first exhaust path for receiving and routing exhaust gases;

a first NO_x adsorber located in the first exhaust path;

a second exhaust path for receiving and routing exhaust gases;

a flow control valve between the exhaust manifold and the first and second exhaust paths for controlling the relative amounts of exhaust gas flowing through the first and second exhaust paths; and

a first injector for injecting a reductant into the exhaust gas stream, the first injector being located so as to inject the reductant at a location immediately adjacent to the flow control valve; ~~to cause~~

wherein there is a pressure drop across the flow control valve that results in turbulent flow in a region immediately adjacent to the flow control valve that includes the reductant injection location, thereby causing mixing of the reductant and the exhaust gas in a relatively short distance and to allow regeneration of the first NO_x adsorber.

2. (Original) The internal combustion engine of claim 1 wherein the first injector is located so as to inject the reductant at a location immediately downstream of the flow control valve along the first exhaust path.

3. (Currently Amended) The internal combustion engine of claim 1 further comprising:

a second NO_x adsorber located in the second exhaust path; and

a second injector for injecting a reductant into the exhaust gas stream, the second injector being located so as to inject the reductant at a location immediately adjacent to the flow control valve; ~~to cause~~

wherein there is a pressure drop across the flow control valve that results in turbulent flow in a region immediately adjacent to the flow control valve that includes the reductant injection location, thereby causing mixing of the reductant and the exhaust gas in a relatively short distance and to allow regeneration of the second NO_x adsorber.

4. (Original) The internal combustion engine of claim 3 wherein the second injector is located so as to inject the reductant at a location immediately downstream of the flow control valve along the second exhaust path.

5. (Original) The internal combustion engine of claim 4 wherein the first injector is located so as to inject the reductant at a location immediately downstream of the flow control valve along the first exhaust path.

6. (Withdrawn) An internal combustion engine with a plurality of cylinders, the engine including an intake manifold and an exhaust manifold, the engine further comprising:

a first exhaust path for receiving and routing exhaust gases;

a first NO_x adsorber located in the first exhaust path;

a second exhaust path for receiving and routing exhaust gases;

a first flow control valve between the exhaust manifold and the first exhaust path and a second flow control valve between the exhaust manifold and the second exhaust path, the first and second flow control valves controlling the relative amounts of exhaust gas flowing through the first and second exhaust paths; and

a first injector for injecting a reductant into the exhaust gas stream, the first injector being located so as to inject the reductant at a location adjacent to the first flow control valve to cause mixing of the reductant and the exhaust gas and to allow regeneration of the first NO_x adsorber.

7. (Withdrawn) The internal combustion engine of claim 6 further comprising:

a second NO_x adsorber located in the second exhaust path; and

a second injector for injecting a reductant into the exhaust gas stream, the second injector being located so as to inject the reductant at a location adjacent to the second flow control valve to cause mixing of the reductant and the exhaust gas and to allow regeneration of the second NO_x adsorber.

8. (Withdrawn) The internal combustion engine of claim 7 wherein the second injector is located so as to inject the reductant at a location immediately upstream of the second flow control valve along the second exhaust path.

9. (Withdrawn) The internal combustion engine of claim 6 wherein the first injector is located so as to inject the reductant at a location immediately upstream of the first flow control valve along the first exhaust path.

10. (Currently Amended) In an internal combustion engine with a plurality of cylinders, the engine including an intake manifold and an exhaust manifold, the engine further including, a first exhaust path for receiving and routing exhaust gases, a first NO_x adsorber located in the first exhaust path, a second exhaust path for receiving and routing exhaust gases, at least one flow control valve between the exhaust manifold and the first and second exhaust paths for controlling the relative amounts of exhaust gas flowing through the first and second exhaust paths, and a first injector for injecting a reductant into the exhaust gas stream, the first injector being located so as to inject the reductant at a location immediately adjacent to a flow control valve, to cause wherein there is a pressure drop across the flow control valve that results in turbulent flow in a region immediately adjacent to the flow control valve that includes the reductant injection location, thereby causing mixing of the reductant and the exhaust gas in a relatively short distance and to allow regeneration of the first NO_x adsorber, the method comprising:

operating the engine in an active mode wherein exhaust gas flows through the first exhaust path and through the first NO_x adsorber such that the first NO_x adsorber adsorbs NO_x from the exhaust gas; and

subsequently, operating the engine in a regenerative mode wherein a reduced amount of the exhaust gas flows through the first exhaust path and through the first NO_x adsorber and wherein the reductant is injected into the reduced amount of the exhaust gas at a location immediately adjacent to a flow control valve, to cause wherein there is a pressure drop across the flow control valve that results in turbulent flow in a region immediately adjacent to the flow control valve that includes the reductant injection location, thereby causing mixing of the reductant and the exhaust gas in a relatively short distance such that the first NO_x adsorber catalytically reduces the previously adsorbed NO_x to regenerate the first NO_x adsorber.

11. (Currently Amended) In an internal combustion engine with a plurality of cylinders, the engine including an intake manifold and an exhaust manifold, the engine further including, a first exhaust path for receiving and routing exhaust gases, a first NO_x adsorber located in the first exhaust path, a second exhaust path for receiving and routing exhaust gases, a second NO_x adsorber located in the second exhaust path, at least one flow control valve between the exhaust manifold and the first and second exhaust paths for controlling the relative amounts of exhaust gas flowing through the first and second exhaust paths, a first injector for injecting a reductant into the exhaust gas stream, and a second injector for injecting a reductant into the exhaust gas stream, the first injector being located so as to inject the reductant at a location immediately adjacent to a flow control valve, to cause wherein there is a pressure drop across the flow control valve that results in turbulent flow in a region immediately adjacent to the flow control valve that includes the reductant injection location, thereby causing mixing of the reductant and the exhaust gas in a relatively short distance and to allow regeneration of the first NO_x adsorber, the second injector being located so as to inject the reductant at a location immediately adjacent to a flow control valve, to cause wherein there is a pressure drop across the flow control valve that results in turbulent flow in a region immediately adjacent to the flow control valve that includes the reductant injection location,

thereby causing mixing of the reductant and the exhaust gas in a relatively short distance and to allow regeneration of the second NO_x adsorber, the method comprising:

operating the engine in an active mode wherein exhaust gas flows through the first exhaust path and through the first NO_x adsorber such that the first NO_x adsorber adsorbs NO_x from the exhaust gas and exhaust gas flows through the second exhaust path and through the second NO_x adsorber such that the second NO_x adsorber adsorbs NO_x from the exhaust gas;

subsequently, operating the engine in a first regenerative mode wherein a reduced amount of the exhaust gas flows through the first exhaust path and through the first NO_x adsorber and wherein the reductant is injected into the reduced amount of the exhaust gas at a location immediately adjacent to a flow control valve, to cause wherein there is a pressure drop across the flow control valve that results in turbulent flow in a region immediately adjacent to the flow control valve that includes the reductant injection location, thereby causing mixing of the reductant and the exhaust gas in a relatively short distance such that the first NO_x adsorber catalytically reduces the previously adsorbed NO_x to regenerate the first NO_x adsorber; and

subsequently, operating the engine in a second regenerative mode wherein a reduced amount of the exhaust gas flows through the second exhaust path and through the second NO_x adsorber and wherein the reductant is injected into the reduced amount of the exhaust gas at a location immediately adjacent to a flow control valve, to cause wherein there is a pressure drop across the flow control valve that results in turbulent flow in a region immediately adjacent to the flow control valve that includes the reductant injection location, thereby causing mixing of the reductant and the exhaust gas in a relatively short distance such that the second NO_x adsorber catalytically reduces the previously adsorbed NO_x to regenerate the second NO_x adsorber.

12. (Original) The method of claim 11 further comprising:

when the engine is operated in the first regenerative mode and the reduced amount of the exhaust gas flows through the first exhaust path to regenerate the first adsorber, routing a remainder of the exhaust gas through the second exhaust path such that the second adsorber remains active.

13. (Original) The method of claim 11 further comprising:

when the engine is operated in the second regenerative mode and the reduced amount of the exhaust gas flows through the second exhaust path to regenerate the second adsorber, routing a remainder of the exhaust gas through the first exhaust path such that the first adsorber remains active.